

The evolution of the number of tropical nights in some cities of the Iberian Peninsula during the second-half of the 20th century and beginning of the 21st century (1961-2007).

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One of the most apparent manifestation of the increase in the summer minimum temperatures is the increment in the number of tropical nights (>20°C), which impacts coercively on human bioclimatic comfort, on the consumption of water and energy and results in substantial economic losses. The objective of this work is to study the evolution of the number of warm nights in some cities of the Iberian Peninsula (Albacete, Alacant, Badajoz, Beja, Biarritz, Bragança, Cordoba, Lisbon, Madrid, Malaga, Perpinya, Oporto, San Sebastian, Saragossa, Torrevella, Tortosa and Valencia), during the months of June, July, August and September (JJAS), for the period between 1961-2007. The results, according to the non-parametric Mann-Kendall test, indicate that the tendency is significant at a 95% confidence level, in all stations except Braga, Bragança and Oporto. Observations show that the number of tropical nights is always higher in July and August. It is important to point out that the comparison of two sub-periods of the time-series (1961-1983 and 1984-2007) reveals a significant increase of warm nights in June and September in the cities on the Iberian Plateau and an increase in June for the cities located on the Mediterranean coast. The Skewness and Kurtosis analysis of JJAS in the two sub-periods evidence, in most stations, more negative values in the second period, with more warm tropical nights during the summers and a greater heterogeneity, than in the first period, being statistically more poignantly different in the stations of the Mediterranean cities and in the interior of the Peninsula. The application of a Factorial Analysis reveals that the dynamics of the warm nights for the entire period is that of a markedly regional pattern and is not due to the influence of the urban heat island.

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